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Construction Of Flexible Concrete Elements In Buildings

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ABSTRACT

The article provides information on the correct and reasonable design and construction of reinforced concrete beams, girders and stairs of important load-bearing elements of buildings to ensure the strength, durability and operational reliability of the building and its cost-effectiveness.

KEYWORDS

Reinforced concrete beams, girders, stairs, load-bearing elements, operational reliability, cost-effectiveness.

INTRODUCTION

It is known that reinforced concrete beams, girders and stairs are important load-bearing elements of buildings. Their correct and reasonable design and construction play an important role in ensuring the strength, durability and operational reliability of the building and determine its economic efficiency.

In the buildings currently under construction, their flexible elements are often made of cast-in-place concrete. The most important of them - the beams are an element of cast-in-place reinforced concrete frames. In practice, it was found that many serious shortcomings and mistakes are made in the construction of flexible cast-in-place concrete structures of buildings under construction. These are: the reinforcement schemes of the structures do not correspond to the diagram of internal stresses generated in them; the armatures of the base parts of the flexible elements are not reliably anchored, additional longitudinal reinforcing reinforcement rods are not

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installed; absolutely ineffective rods are placed on the unnecessary surfaces of the cut, and so on. As a result, the operational reliability of the building is not ensured due to the fact that the reinforcement of the structures and their nodes is carried out with serious defects, and there is an excessive consumption of expensive reinforcing steel.

Ensuring the correct and reasonable reinforcement of the beams, which are an element of the cast-in-place reinforced concrete frames of new buildings, working on a static indeterminate scheme, will ensure the required strength and long-term durability of the structure and, ultimately, the building (Figures 1, 2).

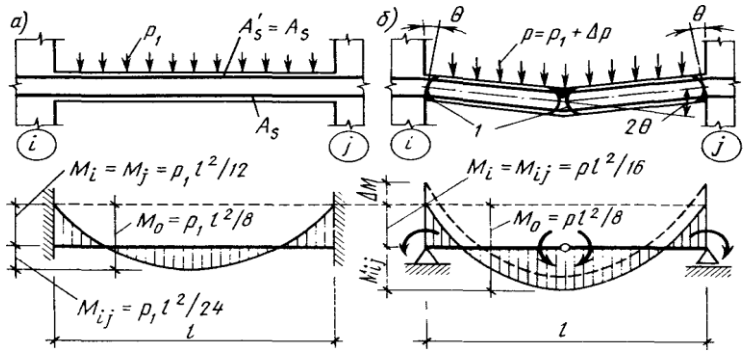

Figure 1. Scheme of operation under loads of double symmetrical reinforced beams fastened on supports: a-elastic stage; by the b-boundary equilibrium method; 1 plastic hinge

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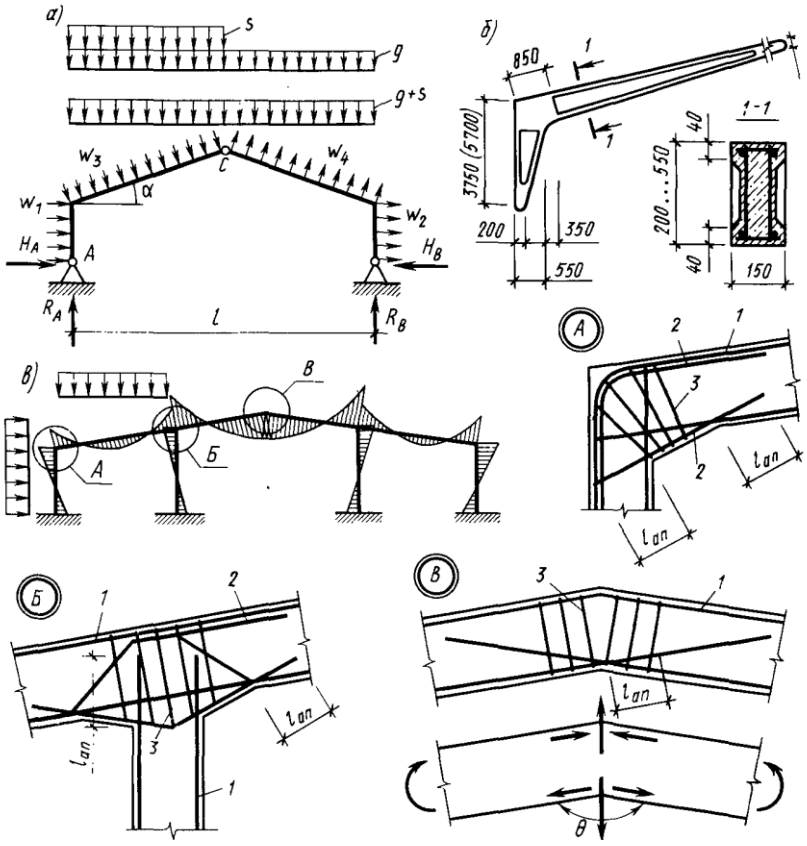

Figure 2. Calculation scheme of three-hinged frame (a), prefabricated half-frame (b), bending moment diagram (c) and reinforcement of cast frame nodes: 1-welded reinforcement joints; 2 additional longitudinal armature rods; 3 additional clamps

Similarly, it is important to ensure that the doors and windows are properly reinforced (Figure 3).

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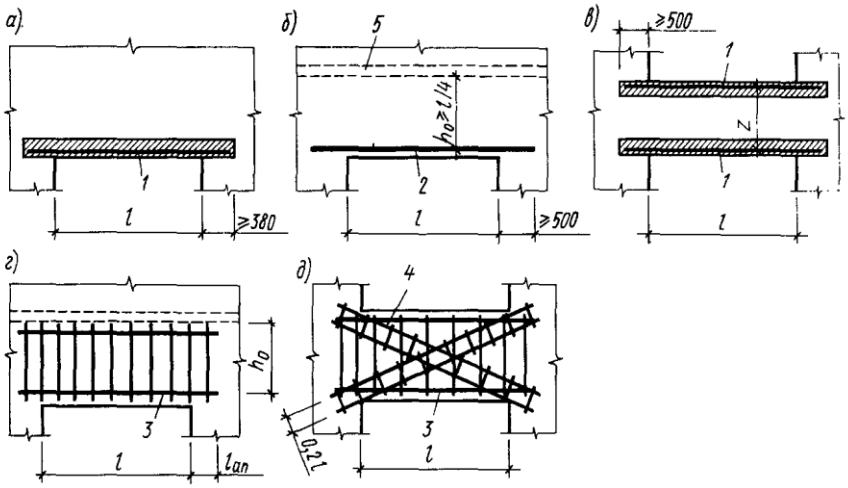

Figure 3. Construction of dams used in stone-brick and concrete walls: 1-prefabricated reinforced concrete element; 2 longitudinal reinforcement placed in a layer of cement mixture; 3-phase horizontal armature test; 4 similarly, placed diagonally; 5-orayopma

It was also found that in the reconstruction of stairs from cast-in-place concrete, their construction is carried out with gross errors, resulting in a sharp increase in the consumption of reinforcement, as well as insufficient strength of the steps.

CONCLUSION

In short, it is of constructive and economic importance to ensure the design and construction of flexible reinforced concrete structures of buildings and structures in accordance with the requirements of the current QMQ, and it is necessary to immediately eliminate the existing errors and shortcomings.

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